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ABSTRACT

This brochure is intended to educate the public about the need to conserve and preserve the earth's environment (man's habitat). It contains an introduction to the ocean world and threats to coastal habitat. Photos and narrative revolve around the theme "Earth is a Marine Habitat." Sections include: "The Web of Life," "Oceans and the United States," "A Habitat is a Home," "How We Affect Marine Habitats," "The Future of United States Marine Habitats," and "A Response to the Challenge." More detailed information is provided for the following regions: Northeast, Southeast, Southwest, Northwest, and Alaska. A color-coded map of the United States shows which states are located in each region. Other maps show exclusive economic zones of the United States. Contact information for the National Marine Fisheries Service is provided. (LZ)

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EARTH IS A MARINE HABITAT

Habitat
Conservation
Program

ED 384 516

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A great diversity of animals inhabit the various layers of a kelp forest.

Introduction

Every day a battle is waged to protect a vital part of our heritage and quality of life: the health and productivity of coastal habitats, such as marshes, estuaries, reefs and banks.

The threat to these habitats is particularly challenging because no one person is responsible. Rather, the continuing loss of coastal wetlands and degradation of coastal waters reflect thousands of decisions to proceed with habitat-destroying human activities. The effects include reduced catches of commercial and sport fish, loss of jobs, dwindling wildlife populations and diminishing recreational opportunities such as fishing and wildlife-watching.

Many coastal activities, such as dredging or filling wetlands, require State and Federal permits. Review of these permits provides an important opportunity for insuring that projects will not harm coastal habitats. The National Marine Fisheries Service (NMFS) in the U.S. Department of Commerce uses its scientific expertise to review proposed projects and to help ensure that projects do not harm sensitive marine habitats.

This brochure is an introduction to the ocean world and some of the serious threats that now face it.

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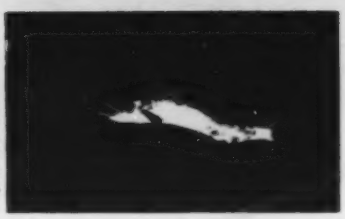
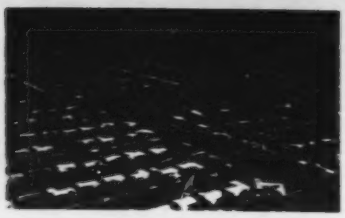


Gary Miller/EPA



Industrial pollution, oil spills, and residential development all exact a cost on marine resources.

The Future of United States Marine Habitats

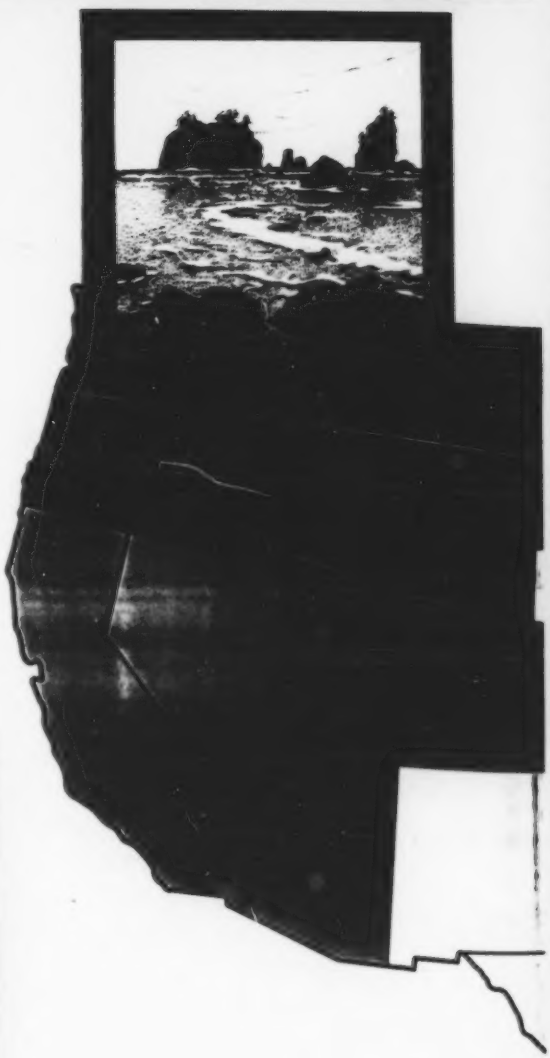
Since World War II, Americans have moved increasingly to the coasts. By the year 2000, three out of four of us will likely live within an hour's drive of a coast. Much of this increase is expected to be in the Sun Belt; the population of Florida alone is predicted to increase by five million people, or 900 people a day.

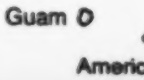
With more people will come greater stress on the coastal marshes and bays where most commercially and recreationally-valuable shellfish and fish spend critical parts of their life. More and more people will live near, or visit, these fragile coastal habitats. Demands for more homes, marinas, larger ports, deeper navigation channels, dams, roads, resorts and factories will threaten continued losses of our most productive coastal habitats.

We risk losing the quality and quantity of living marine resources which many of us depend upon for our livelihoods.

Finally, if the view of some scientists is correct, the Earth's climate is warming. This warming would result in ocean waters expanding and rising. Sea-level rise could pose a threat to coastal buildings; it might also pose a threat to marshes, coral reefs and other coastal habitats whose plant and animal communities may not be able to adapt to rapidly-changing conditions.

Marine Habitats of the United States





A Response to the Challenge

Conservation of marine habitats requires a concerted effort by many people—often in places far removed from the coast. Federal, State and local government agencies, as well as concerned citizens, all have a role to play.

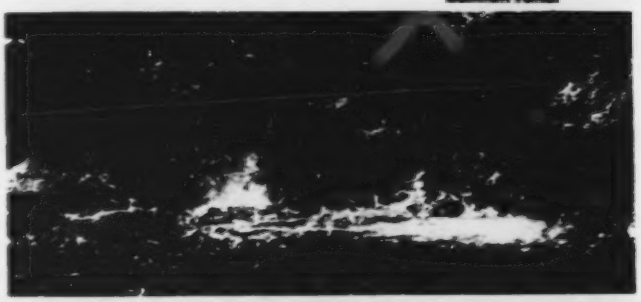
The NMFS exercises a key role in our Nation's efforts to conserve marine habitats. As a part of the Department of Commerce's National Oceanic and Atmospheric Administration, NMFS has a Federal responsibility for conservation of the Nation's living marine resources.

The NMFS Habitat Conservation Program, of the Office of Protected Resources, seeks to conserve the habitats upon which our marine fish and shellfish depend. The program is based on Federal laws and the program's National Habitat Conservation Policy, issued in 1983.

The Fish and Wildlife Coordination Act authorizes NMFS to evaluate developments proposed by the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission and other Federal agencies if these developments may alter the Nation's marine waters. Under the Coordination Act and other laws, the Habitat Conservation Program each year reviews several thousand individual requests for permits to dredge wetlands and bays, deposit dredge spoil in wetlands or coastal waters, drill for oil and gas, dump sewage sludge and chemical wastes and build dams.

The program is supported by NMFS research on the biological effects of human activities, the economic value of coastal habitats, and methods of reducing the loss of coastal habitats.

Dams built on rivers often have resulted in expensive efforts to attempt to restore salmon runs.



SOUTHEAST REGION

Puerto Rico

Virgin Islands

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ALASKA REGION

Richard Townsend

NORTHWEST REGION

Brian Walsh/DOE

SOUTHWEST REGION

Northeast Region

The coastal habitats of New England and the Middle Atlantic States have many areas of rocky shorelines in the north, extensive salt marshes and long sandy beaches in the south. Offshore, submerged banks provide vital habitats for commercially-valuable fish such as cod and haddock. Georges Bank has historically been one of the richest fishing grounds in the world. Stellwagen Bank off Cape Cod also is a very productive submerged mountain that supports many species of fish.

The coastline in this region is one of the most heavily populated and visited in the country. Poorly-planned commercial and residential development has led to severe pollution problems in nearshore areas such as Buzzards Bay and Boston Harbor. Only a small fraction of the coastal marshes in this region remain. Offshore drilling for oil and gas, as well as transportation of oil and other cargo, can pose continuing threats.

Industrial, agricultural and urban wastes have produced such high nutrient levels in the Chesapeake and other bays that blooms of algae regularly rob some bay waters of oxygen, reducing the area in which other plants and animals can live. Already, such contamination has contributed to drastic declines in landings of fish and shellfish, including oysters, shad, striped bass and river herring.

Southeast Region

The southeast region, which includes eight States from North Carolina to Texas, Puerto Rico and the U.S. Virgin Islands, contains 29,900 miles of tidal shoreline—more than half the tidal shoreline in the lower 48 States. Besides coral reefs and hard bottom areas offshore, the region has more than 300 estuaries containing 17.2 million acres of marsh. The region supports most of our mangrove swamps and an estimated five million acres of seagrass meadows in which fish, shellfish and sea turtles feed and find shelter.

At least 96 percent of commercial and 70 percent of recreationally important fish and shellfish in this region need estuaries and near shore marine habitats at some point in their life cycles. In 1990, commercial landings amounted to about 1.9 billion pounds of fish and shellfish worth $810 million dockside. In 1985, 11 million recreational fishermen caught more than 222 million fish and spent more than $3.4 billion in the process.

A tremendous increase in the number of coastal residents and industries is destroying and degrading coastal wetlands and waters. Pollutants from as far away as Montana and Pennsylvania are carried into the Gulf of Mexico by the Mississippi River alone. Currently, tens of thousands of acres of coastal wetlands are being lost annually in the region. In Louisiana, coastal marshes are disappearing at rates approaching 40 square miles per year. Texas has probably already lost a third of its one million acres of coastal marshes and large areas of seagrass beds in the lagoons near Mexico.

Since 1982, fish and shellfish landings have decreased by 42 percent and recreational fishermen are having a harder time finding desirable fish to catch. It is believed that wetland loss and pollution have contributed to these declines.

Southwest Region

The California coastline has many areas of cliffs interspersed with sandy beaches. San Francisco Bay is California's largest estuary and is surrounded by one of the most densely populated areas along the coast. Offshore, the flat slope of the continental shelf is broken by banks and canyons that concentrate nutrients, thereby attracting fish, marine mammals and sea birds.

Unlike much of the Atlantic coast, which is influenced by the warm Gulf Stream, offshore waters of the Pacific Ocean are generally influenced by the cold, southerly-flowing California Current. Cold water rich in nutrients regularly wells up from deeper offshore areas and enriches coastal waters, leading to blooms of phytoplankton which support dramatic increases in fish, marine mammals and sea bird populations.

While California's northern coast and offshore islands are relatively undeveloped, 90 percent of California's inland coastal wetlands has been converted to residential, commercial and agricultural uses. San Francisco and Santa Monica Bays are polluted by agricultural runoff, municipal sewage, dredge spoil and industrial discharges. Alteration of freshwater streams has led to dramatic declines in several historically-important salmon runs.

This region also includes the Central and West Pacific waters around the islands of Hawaii, Guam, Northern Marianas, Trust Territories of the Pacific, and Samoa, which are deep, clear and nutrient-poor. Coastline habitats include mudflats and mangrove forests. Coral reefs often ring islands and encircle lagoons.

While many island areas remain pristine, the more populated areas have suffered. Mangrove forests have been removed. Upland agriculture and alteration of stream flows have changed the chemical balance in lagoons and nearshore areas, reducing the productivity of these sensitive habitats.

Northwest Region

The coastlines of Oregon and Washington are rocky and mountainous and interspersed with sandy beaches. Rocky islands, small bays,and estuary systems with mudflats are common. The generally rugged character of the Pacific Northwest coast is interrupted by the Columbia River estuary, an embayment characterized by high freshwater inflow and an inland marsh complex. Puget sound, a fjord, is an ecosystem unto itself, displaying most of the coastal features found worldwide in the temperate latitudes. Offshore, the continental shelf is cut through by canyons, some of which are extremely close to shore.

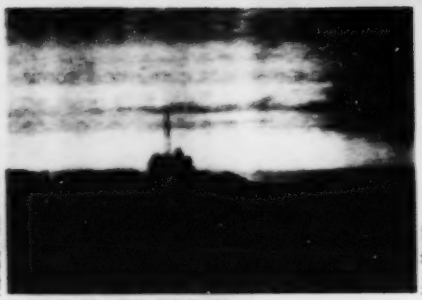
The effects of overfishing and land, water, and energy development activities on the Columbia and other Northwest rivers have devastated runs of salmon that historically supported large commercial and sport fisheries. Current runs are a fraction of those that existed 100 years ago.

Water quality is generally good, but localized areas in Puget Sound contain contaminated sediments. Efforts are underway to clean up contaminated areas and develop regional plans that will reduce future pollution from urban, industrial, and agricultural sources.

Michael Weber

Richard Frear/N.P.S.

SOUTHEAST REGION



Nina Young

NORTHEAST REGION

Prince William Sound, Alaska

Olympic Peninsula, Washington

Big Sur Coast, California

Outer Banks, North Carolina

Cape Cod, Massachusetts

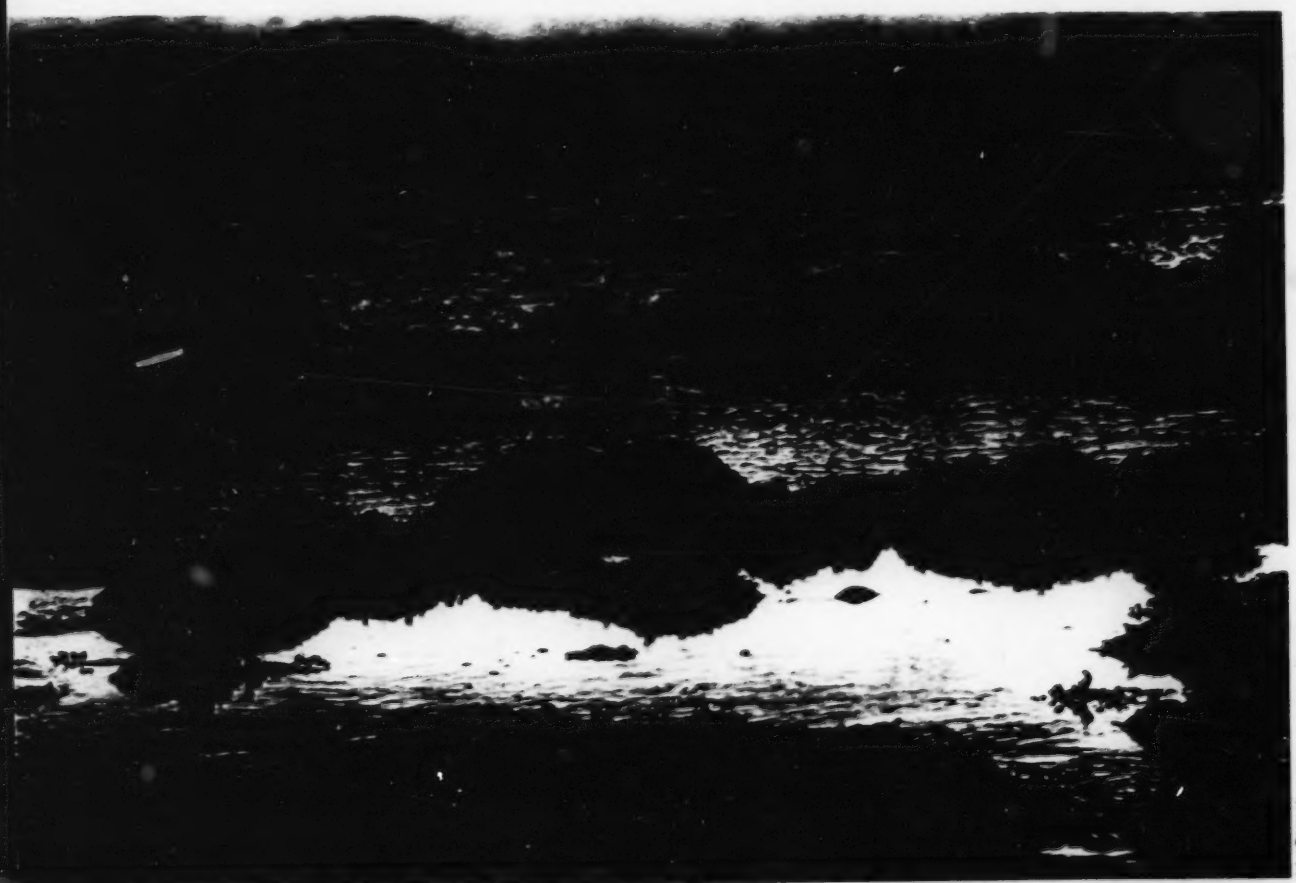
Alaska Region

The Alaska region includes half the coastline of the United States. This exceptionally long coastline contains a wide variety of habitats including fjords and ice fields found nowhere else in the United States. Large estuaries in southeastern Alaska, the Gulf of Alaska, the Alaska peninsula and the Aleutian Islands provide nurseries for many marine species. Elsewhere, the coast is rocky and precipitous. Seasonal ice affects about 4,000 miles of the tidal shoreline. Nearly 70 percent of the U.S. continental shelf is off Alaska; roughly 90 percent of Alaska's landings of fish and shellfish are caught in these waters.

Alaskan waters support some of the heaviest fishing in the world including major runs of salmon. Fisheries with billions of pounds of fish and shellfish, including pollock, halibut and king crabs depend upon these relatively pristine waters. These waters also host some of the world's largest populations of marine mammals and sea birds.

Alaska's small human population and limited industrial and hydroelectric development have kept destruction and degradation of important habitats to a minimum. This is changing as industry begins to exploit Alaska's non-renewable resources, including petroleum, sand and gravel, as well as renewable resources such as timber, fish and shellfish. Development of these resources on land and at sea will increasingly stress these habitats.

This brochure was designed and produced by the Center for Marine Conservation under contract to the National Oceanic and Atmospheric Administration.



John Durant

Earth is a marine planet

Who can forget those first photographs of our Earth from space, a shimmering blue ball in the dark expanse of the solar system?

Those early photographs by astronauts confirmed something we had always known but may not have fully grasped: the Earth's great continents are just islands in an even greater sea of blue.

In the 16th century, Copernicus also changed how the world was viewed when he demonstrated that it is the Sun, and not the Earth, around which the planets revolve. Unlike the Copernican revolution, however, the new view of the Earth as an ocean planet has not been fully recognized.

As we pursue our lives on the 30 percent of the Earth not covered by water, the oceans continue to generate winds and storms, to produce much of the oxygen we breathe, to reform and reshape the coastline where many of us live, work, or vacation...and to provide critical habitats for populations of marine life that are vital to our nutritional and economic well-being.

Now, another long-held belief is being challenged: that we can pollute and even destroy coastal habitats, such as marshes and offshore banks and reefs, without causing permanent losses of fish, sea birds, marine mammals, sea turtles and the many other creatures and plants of the oceans.

The Web of Life

As on land, life in the oceans ultimately depends upon the Sun's energy. Like green plants on land, microscopic marine plants called phytoplankton capture this energy and use it to bind water and carbon dioxide together into packets of food. In shallow areas, seagrasses and mangroves provide additional food for fish and shellfish.

During this process which is called photosynthesis, these tiny plants do several important things. First, they release great quantities of oxygen and absorb carbon dioxide. Then animals that consume these plants are consumed by other, often larger animals. For example, shrimp eat phytoplankton and are themselves eaten by fish. The fish, in turn, will be eaten by dolphins or humans. These tiny plants literally make the energy of the sun available to marine animals from the smallest shrimp to the great blue whale.

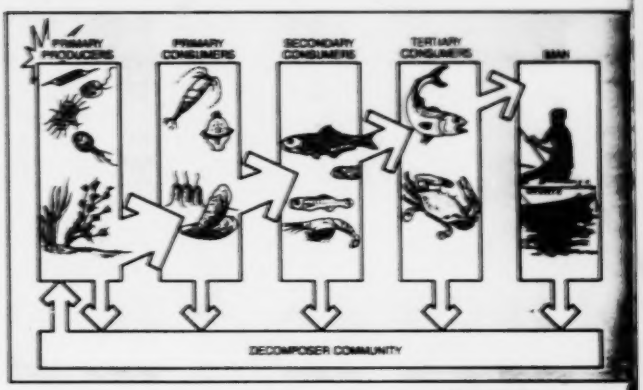
Oceans and the United States

The United States possesses great ocean riches. We enjoy exclusive rights over fish, shellfish, marine mammals, sea birds, and mineral resources within 200 miles of our shores. In 1990 U.S. commercial fishermen harvested 11 billion pounds of fish worth $3.9 billion, most within the nearshore waters of our 2.2 million square miles of ocean territory. Marine recreational fisheries annually involve some 17 million anglers who expend over $7.2 billion.

Each year, tourists spend millions of dollars for nature cruises to observe such wildlife as marine mammals and sea birds. Beaches attract millions of people for relaxation and recreation. In California, money spent in coastal areas accounts for more than 80 percent of the State's tourism revenues.

Coasts and bays have always been favorite sites for cities. Even before the Industrial Revolution, manufacturers used coastal waters for cooling and disposal of wastes. From the earliest days of our Nation, commerce and daily life have depended on coastal ports for transport of goods and materials.

As our coastal settlements and industries have expanded, we have changed marine areas, often irreversibly. The results have been drastic declines in populations of some fish and shellfish as well as increased instances of disease in fish and shellfish.



Animals and plants of the ocean are connected by a network called the food web. Animals from shrimp to humans depend on the energy passed from the sun through this web.

How We Affect Marine Habitats

We damage or destroy productive coastal habitats in several ways:

1) alteration of habitats,such as filling or dredging marshes to build waterfront houses;

2) contamination of waters with toxic substances, such as industrial chemicals and pesticides;

3) pollution of waters with excessive nutrients, such as agricultural and home fertilizers and domestic sewage; and

4) construction on coastal rivers of dams, which block upstream fish migrations and destroy downstream migrants in power turbines and other intakes.

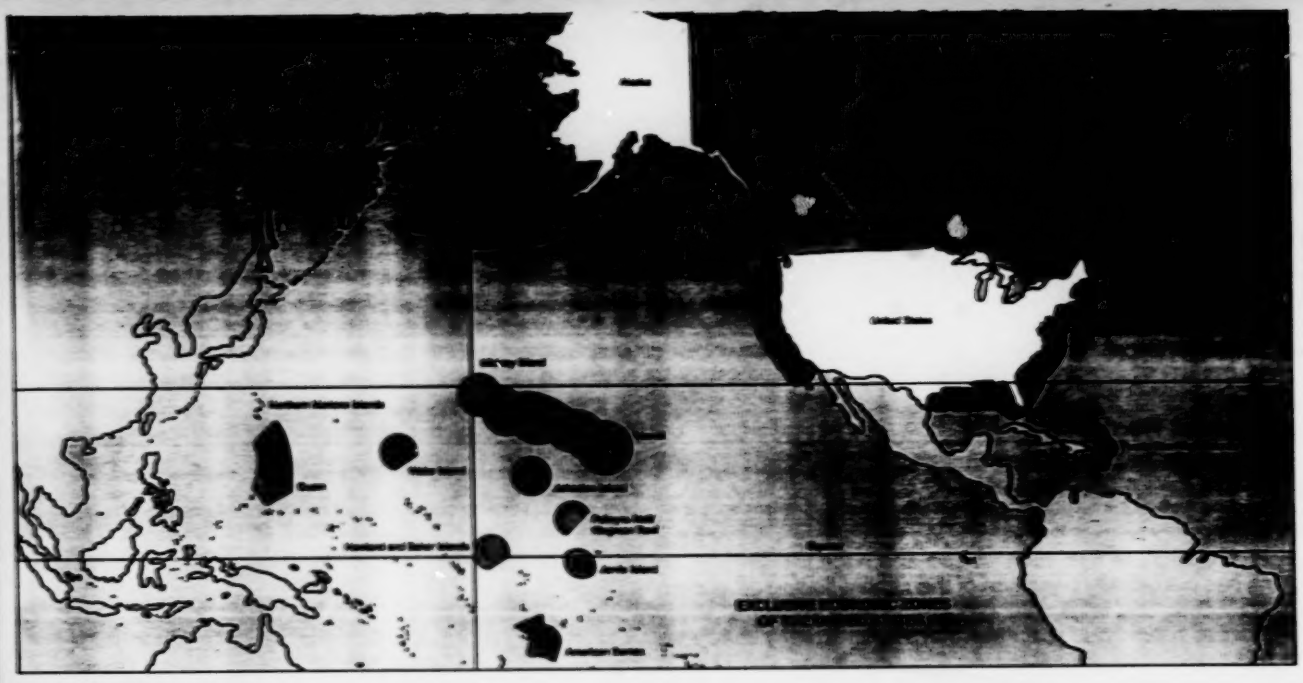
Our activities have direct and indirect effects. For instance, when we dredge a ship channel to remove accumulated sediment, we may also destroy seagrass beds and other habitats that provide food and shelter for fish and shellfish. Also, this can resuspend pollutants that have settled in the sediments. Recycled pollutants can harm fish and shellfish by reducing the ability of young to survive.

When we dredge, an area must be found to deposit the dredged materials. In the past, we have often deposited these materials in marshes that many have regarded as worthless and suitable only for development. In doing so, we have covered some of the most important and productive marine habitats.

Activities far from the coast can also damage marine habitats. Agricultural activities can result in soil, pesticides, fertilizer residues and other pollutants being carried into streams during rain storms and then to coastal waters. Excessive amounts of fertilizers washed into marine waters can cause undesirable blooms of algae. In high concentrations, the otherwise beneficial algae screen sunlight from other marine plants that are depended upon by fish & shellfish. When these algae die and decompose, they may deplete the oxygen from brood areas of water, killing fish and shellfish.

Dams on rivers often prevent marine fish that lay their eggs in fresh waters from completing their migration from the ocean. Dams and diversions also reduce the flow of fresh water into bays and estuaries, resulting in loss of marshlands, seagrass beds and water quality important in the early life of marine fishes and shellfish.

Highway construction, improper disposal of motor oil, use of pesticides and fertilizers in residential areas and on golf



A Habitat Is a Home

Animals and plants need shelter, sources of food and reproductive mates to live and reproduce. Some types of animals and plants require specific kinds of food and shelter, while others tolerate a wide range of conditions.

Many animals use different types of habitats at different times in their lives. Some species of fish and shellfish spend their early lives in marshes or bays where food and shelter are plentiful. Later in life, these same animals move into different environments in the open ocean where they eat different types of food.

Some habitats are more productive than others. For instance, coastal marshes in the southeastern United States produce more tons of vegetation per acre than our rich Midwestern agricultural lands. As a result, bays and coastal waters are rich in shrimp, crabs and various species of fish. On the other hand, waters far from land and not reached by nutrients brought to the ocean by rivers generally are not as productive. Here animal life is not so abundant.

Thus, coastal waters support larger populations of fish and shellfish largely because nutrients and shelter are more available. Almost one-half of the fish harvested in the United States are caught within three miles of shore. It is this most productive part of our ocean waters that is increasingly vulnerable to our negligence.

A sea anemone's tentacles provide protective habitat for a shrimp.

Sea star grazing clears the way for new colonization.

Donna Devlin

courses, release of poorly treated or untreated sewage, faulty septic tanks and discharge of toxic wastewater by industrial facilities all add contaminants to coastal waters.

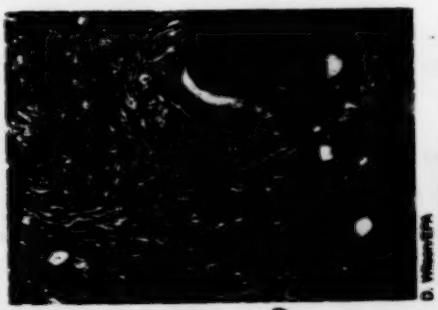
More often than not, habitat loss and degradation have caused serious reductions in fish and shellfish populations. From industrial giant to individual citizen, we all have a hand in determining the health and productivity of our coastal waters.

Flounder with a tumor.

Industrial Effluent

Filling of an estuary.

Hamon



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The fringes of the oceans support the greatest abundance of marine life. Rocky and marshy coastal areas are two very different habitats that in their own unique ways contribute to the productivity of the oceans.

John Dimont

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